

HEALTH CONSULTATION

**VULCAN MATERIALS COMPANY
ASPHALT FIRE**

Calmat Division

McClintock Road
Salt River Pima-Maricopa Indian Community
Scottsdale, Arizona

April 13, 1999

Arizona Department of Health Services
Office of Environmental Health
under cooperative agreement with the
Agency for Toxic Substances and Disease Registry



ACKGROUND

The Arizona Department of Environmental Quality (ADEQ) asked the Arizona Department of Health Services (ADHS) to evaluate the health threat



to residents from exposures to ash fallout from a fire at an asphalt plant located on the Salt River Indian Reservation. [See appendix for site map].

On April 13, 1999, at 12:00am, a fire broke out at the CalMat Division asphalt plant located on the Salt River Indian Reservation, in Mesa, Arizona. Mesa Fire Department arrived approximately 12:15am to find that approximately 25,000 gallons of diesel fuel and used motor oil had caught on fire. A low cloud cover prevented the black plume of smoke from completely dissipating sending the plume southward over residences in Mesa. It began to rain at approximately 2:30am. The rain continued until 6:00am causing the combustion products to fall to the ground in Mesa neighborhoods.

The facility, which makes asphalt and concrete, has recently been bought out by Vulcan, Inc. The site is located just north of the Salt River between Dobson and Alma School Roads. It is surrounded by agricultural farming areas to the east, north, and west, and is bordered by the Salt River to the south. The closest residences in either direction are more than one mile from the site.

ADHS arrived at the scene at approximately 6:15am to find that the fire was under control but still smoldering and sending plumes of black smoke into the air and southward over Mesa. The ADEQ sampled ambient air in nearby neighborhoods in Mesa south of the site. They used a PID to test for VOCs, and other constituents. Preliminary results showed no chemicals of concern.

Calls began to come into the Mesa Fire Department around 7:30 am from Mesa residents indicating that a layer of black ash had covered the driveways and sidewalks, cars, houses, and swimming pools of residences as far as 5 miles from the site. In order to address these concerns, ADHS staff drove around the neighborhoods to observe the ash fallout and spoke with residents to assess their concerns. ADHS also visited the elementary schools nearest the site to assess the ash fallout in the schoolyards and sidewalks and address any health concerns of the school staff and parents.

The Maintenance Operations Supervisor for the City of Mesa school system brought in cleanup crews at 7:00 am to clean up the schools as fast as possible before children began to play in the school yards. The closest elementary schools, Hale and Whittier, were cleaned up first. Cleaning crews first arrived at Hale Elementary where they washed down the sidewalks, playgrounds, school equipment, and grassy areas. Crews were not able to reach Whittier Elementary School until approximately 10:00am, after children had already been allowed to play in the schoolyards. Whittier Elementary School was the closest school to the site and was affected the most. Large areas of black soil could be seen in the dirt areas between the sidewalks and around the school.

Soil samples were taken by both ADEQ and SEACOR (hired by Vulcan, Inc.) at Whittier Elementary School. Samples were analyzed using EPA Method 8260B for volatile organics (VOCs), EPA 6010 B for metals, and EPA 8310 for Petroleum Aromatic Hydrocarbons (PAHs). Results of the tests showed trace levels of cadmium, chromium, lead, and some PAHs, and no evidence of VOCs. The presence of chromium in the sampling data is thought to be from the paint on the fuel tanks that burned. Lead is found in minute amounts in used motor oil.

The levels of these contaminants were compared to the Arizona Residential Remediation Levels (SRLs). SRLs are protective of human health, including sensitive groups, over a lifetime. Chemical concentrations in soils that exceed SRLs may not necessarily represent a health risk. Rather, when contaminant concentrations in soil exceed these standards, further evaluation may be necessary to determine whether the site poses an unacceptable risk to human health. Results are shown in Tables 1 and 2 below.

Table 1: SEACOR Sample Results Taken At Whittier Elementary School on April 14, 1999.

| Chemicals | Soil 1 (mg/kg) | Soil 2 (mg/kg) | Wipe 1 (mg/kg) | Wipe 2 (mg/kg) | SRL (mg/kg) | Exceeds SRL |
|------------------------|----------------|----------------|----------------|----------------|-------------|-------------|
| Arsenic | < 5.0 | < 5.0 | < 0.0050 | < 0.0050 | 10 | NO |
| Cadmium | < 2.0 | < 2.0 | < 0.0020 | < 0.0020 | 38 | NO |
| Chromium | 11 | 9.5 | <0.0060 | < 0.0050 | 2100 | NO |
| Phenanthrene | 0.020 | ND | ND | ND | NA | NO |
| Fluoranthene | 0.20 | ND | ND | ND | 2600 | NO |
| Pyrene | 0.083 | ND | ND | ND | 2000 | NO |
| Benzo(a)anthracene | 0.084 | ND | ND | ND | 0.61 | NO |
| Benzo(b)fluoranthene | 0.050 | ND | ND | ND | 6.1 | NO |
| Benzo(k)fluoranthene | 0.028 | ND | ND | ND | 61 | NO |
| Benzo(a)pyrene | 0.058 | ND | ND | ND | .61 | NO |
| Indeno(1,2,3-cd)pyrene | 0.024 | ND | ND | ND | 6.1 | NO |
| Chrysene | 0.088 | ND | ND | ND | 610 | NO |

Table 2: ADEQ Soil Sampling Results Taken at Whittier School on April 13, 1999.

| Chemicals | Soil Sludge (mg/kg) | SRL (mg/kg) | Exceeds SRL |
|-----------|---------------------|-------------|-------------|
| Cadmium | 0.105 | 38 | NO |
| Chromium | 7.85 | 2100 | NO |
| Lead | 17.8 | 400 | NO |

Levels of chromium, cadmium, lead, and some of the PAHs were far below their respective SRLs.

COMMUNITY CONCERNS

Community concerns were primarily focused on the cleanup of the ash from the cars, sidewalks, swimming pools, etc. in the Mesa neighborhoods. Very few health concerns were voiced by the community. However, the Mesa School Maintenance Operations Supervisor and principals of Hale and Whittier Elementary Schools were very concerned about the health of the children who might be exposed to the ash and asked for a health evaluation of the situation. Since the composition of the ash was not known, ADHS and ADEQ staff suggested to the principals of both schools that no children be allowed to play in the ash until it was properly cleaned up and its composition had been determined. Vulcan responded quickly by hiring an independent

contractor to take samples of the ash and determine its composition in order to address any community health issues.

The Mesa School Maintenance Operations cleanup crews began to clean up the school yard at Hale first and then went to Whittier Elementary School around 10:00am. No children were allowed to go out and play in the ash at Hale Elementary School until all the clean up was completed which prevented any possible exposures to the ash. ADHS suggested that the children not be let out until all the ash was cleaned up and the areas that had been washed down were dry before letting the children out to play or for lunch. However, children at Whittier were allowed to play in the school yard before the cleanup crew had arrived. ADHS staff suggested that children be made aware of the situation and not allowed to play in the school yard until the cleanup was finished. There were large areas of darkened soil and ash mixed in rain puddles that could be seen in the dirt between the sidewalks on the school grounds, as well as large areas of soot on the sidewalks.

Vulcan received over 100 calls from residents in Mesa during the next several days following the fire. The main community concerns focused on the cleanup process and who was going to pay for it. Very few health concerns were voiced by the community. Vulcan was very responsive in handling the situation. All community calls were returned, residents were contacted and told what to do to clean up the ash and how to recover costs.

DISCUSSION

According to Vulcan the two constituents that burned in the fire were diesel fuel and on-specification used oil fuel. There are two residential areas in Mesa where the ash fallout occurred. One was the area directly south of the site and the other was an area located in east Mesa around Stapley St. Sampling data showed trace amounts of metals including cadmium, chromium, and lead and some PAHs in the ash. Levels of the metals and PAHs were well below their respective screening levels. Results suggest that dermal or ingestion exposures to the ash either by children or adults would not be expected to cause adverse health affects.

According to Manager for Environmental Affairs for Vulcan the main concern of residents is how to clean up the ash and who will pay for the clean up costs. Vulcan has received over 100 calls from Mesa residents and only a few have voiced any health concerns about the situation. This could be due to the fact that most people were asleep during the incident and no one saw the fire or smelled the smoke. Most likely, windows were closed that night since it was chilly and rainy the evening before the fire. In addition, Vulcan has been extremely responsive to the situation and is addressing everyone's concerns. They have directed residents to contract with cleaning companies to clean the ash and fallout residue off their driveways, houses, lawns, cars, and out of their swimming pools and have offered to pay for these services. Many residents have responded by cleaning up the ash themselves. The response of Vulcan to the community has been one of openness and honesty and has been extremely well managed, preventing community concerns. Vulcan's quick and thorough response is commendable.

CONCLUSIONS

No acute health symptoms were reported by residents in Mesa from the widespread fallout of ash. Sampling data showed that the ash contained only trace levels of lead, cadmium, chromium, and some PAHs, suggesting that exposures by residents in Mesa to the ash would not be expected to cause any health affects. The major concern of residents focused on how to clean up the ash. We conclude that the fallout ash did not present a public health hazard.

RECOMMENDATIONS

1. The ADHS will present these results to the public.

AUTHORS

Jan McCormick, MPH
Office of Environmental Health
Arizona Department of Health Services

Will Humble, MPH
Chief
Office of Environmental Health
Arizona Department of Health Services

Regional Reviewer

Dan Strausbaugh, MPH
ATSDR-Region IX
San Francisco, CA

Technical Project Officer

William Greim
Division of Health Assessment and Consultation
ATSDR
Atlanta, GA

REFERENCES

ATSDR. *Toxicological Profile for Total Petroleum Hydrocarbons (TPH)*. U.S. Department of Health and Human Services. February 22, 1999.

NIOSH, *Pocket Guide to Chemical Hazards*, US Department of Health and Human Services, Publication No. 97-140, June 1997.